What is claimed is:

1. A method of heat-treating a workpiece, the method comprising:

   a) pre-heating the workpiece to an intermediate temperature;

   b) heating a surface of the workpiece to a desired temperature greater than the intermediate temperature; and

   c) enhancing cooling of the workpiece.

2. The method of claim **1** wherein enhancing comprises absorbing radiation thermally emitted by the workpiece.

3. The method of claim **2** wherein absorbing comprises absorbing the radiation at a radiation absorbing surface.

4. The method of claim **3** wherein absorbing comprises absorbing the radiation at a wall of a radiation absorbing chamber.

5. The method of claim **2** wherein absorbing comprises absorbing the radiation thermally emitted by the workpiece at a selective-filtering system.

6. The method of claim **5** wherein pre-heating the workpiece comprises transmitting radiation produced by an irradiance source through a filtering device of the selective-filtering system to the workpiece.

7. The method of claim **6** wherein transmitting comprises transmitting the radiation to a second surface of the workpiece.

8. The method of claim **5** wherein heating the surface of the workpiece comprises transmitting radiation produced by an irradiance source through a filtering device of the selective-filtering system to the surface of the workpiece.

9. The method of claim **5** further comprising cooling the selective-filtering system.

10. The method of claim **9** wherein cooling the selective-filtering system comprises causing a liquid to flow across a surface of a window of the selective-filtering system.

11. The method of claim **9** wherein cooling the selective-filtering system comprises causing a liquid to flow in a space defined between first and second spaced apart windows of the selective-filtering system.

12. The method of claim **1** wherein heating the surface comprises rapidly heating the surface to the desired temperature by activating a source of thermal flux or adiabatic energy.

13. The method of claim **12** further comprising deactivating the source of thermal flux or adiabatic energy.

14. The method of claim **1**, wherein pre-heating the workpiece to the intermediate temperature comprises pre-heating the workpiece to a temperature in the range of **600**°C to **1250**°C.

15. The method of claim **1**, wherein heating the surface of the workpiece to the desired temperature comprises heating the surface to a temperature in the range of **1050**°C to **1430**°C.

16. The method of claim **1**, wherein pre-heating comprises pre-heating the workpiece for a time period greater than a thermal conduction time of the workpiece.

17. The method of claim **1**, wherein heating comprises heating the surface of the workpiece for a time period less than a thermal conduction time of the workpiece.

18. The method of claim **1**, wherein heating the surface of the workpiece comprises commencing said heating substantially immediately when the workpiece reaches the intermediate temperature.

19. The method of claim **18** wherein commencing comprises commencing said heating within an interval following the arrival of the workpiece at the intermediate temperature, the interval having a duration less than or equal to a thermal conduction time of the workpiece.

20. The method of claim **1**, wherein the workpiece is a semiconductor wafer.

21. The method of claim **1**, wherein pre-heating comprises pre-heating the workpiece at a rate of at least **100**°C per second.

22. The method of claim **1**, wherein pre-heating comprises irradiating the workpiece with electromagnetic radiation produced by an arc lamp.

23. The method of claim **1**, wherein heating comprises irradiating the workpiece with electromagnetic radiation produced by a flash lamp.

24. The method of claim **1**, wherein enhancing comprises allowing the workpiece to cool at a rate of at least about **100**°C per second.

25. A system for heat-treating a workpiece, the system comprising:

a) a pre-heating device operable to pre-heat the workpiece to an intermediate temperature;

b) a heating device operable to heat a surface of the workpiece to a desired temperature greater than the intermediate temperature; and

c) a cooling enhancement system for enhancing cooling of the workpiece to a temperature below the intermediate temperature.

26. The system of claim **25** wherein said cooling enhancement system comprises an absorption system operable to absorb radiation thermally emitted by the workpiece.

27. The system of claim **26** wherein said absorption system comprises a radiation absorbing surface.

28. The system of claim **27** wherein said radiation absorbing surface comprises a wall of a radiation absorbing chamber.

29. The system of claim **26** wherein said absorption system comprises a selective-filtering system.

30. The system of claim **29** wherein said selective-filtering system comprises a filtering device interposed between said pre-heating device and the workpiece and configured to transmit radiation produced by said pre-heating device to the workpiece.

31. The system of claim **30** wherein said filtering device is configured to transmit the radiation to a second surface of the workpiece.

32. The system of claim **29** wherein said selective-filtering system comprises a filtering device interposed between said heating device and the workpiece and configured to transmit radiation produced by said heating device to the surface of the workpiece.

33. The system of claim **29** further comprising a cooling subsystem for cooling said selective-filtering system.

34. The system of claim **33** wherein said selective-filtering system comprises at least one window, and wherein said cooling subsystem comprises a liquid-cooling subsystem for causing a liquid to flow across a surface of said window.

35. The system of claim **33** wherein said selective-filtering system comprises first and second spaced apart windows, and wherein said cooling subsystem comprises a liquid-cooling subsystem for causing a liquid to flow in a space defined between said windows.

36. The system of claim **25** wherein the heating device comprises a source of thermal flux or adiabatic energy operable to rapidly heat the surface to the desired temperature.

37. The system of claim **25**, wherein said pre-heating device is operable to pre-heat the workpiece to a temperature in the range of **600**°C to **1250**°C.

38. The system of claim **25**, wherein said heating device is operable to heat the surface to a temperature in the range of **1050**°C to **1430**°C.

39. The system of claim **25**, wherein said pre-heating device is operable to pre-heat the workpiece for a time period greater than a thermal conduction time of the workpiece.

40. The system of claim **25**, wherein said heating device is operable to heat the surface of the workpiece for a time period less than a thermal conduction time of the workpiece.

41. The system of claim **25**, wherein said heating device is operable to commence heating the surface substantially immediately when the workpiece reaches the intermediate temperature.

42. The system of claim **41**, wherein said heating device is operable to commence heating the surface within an interval following the arrival of the workpiece at the intermediate temperature, the interval having a duration less than or equal to a thermal conduction time of the workpiece.

43. The system of claim **25**, wherein the workpiece is a semiconductor wafer.

44. The system of claim **25**, wherein said pre-heating device is operable to pre-heat the workpiece at a rate of at least **100**°C per second.

45. The system of claim **25**, wherein said pre-heating device comprises an arc lamp operable to irradiate the workpiece with electromagnetic radiation.

46. The system of claim **25**, wherein said heating device comprises a flash lamp operable to irradiate the workpiece with electromagnetic radiation.

47. The system of claim **25**, wherein said cooling enhancement system allows the workpiece to cool at a rate of at least about **100**°C per second.

48. A system for heat-treating a workpiece, the system comprising:

a) means for pre-heating the workpiece to an intermediate temperature;

b) means for heating a surface of the workpiece to a desired temperature greater than the intermediate temperature; and

c) means for enhancing cooling of the workpiece.

49. The system of claim **48** wherein said means for enhancing comprises means for absorbing radiation thermally emitted by the workpiece.

50. A selective-filtering system for use in heat-treating a workpiece, the system comprising:

a) a first filtering device configured to transmit radiation from a pre-heating device to the workpiece to pre-heat the workpiece to an

intermediate temperature, and configured to absorb radiation thermally emitted by the workpiece; and

b) a second filtering device configured to transmit radiation from a heating device to a surface of the workpiece to heat the surface to a desired temperature greater than the intermediate temperature, and configured to absorb radiation thermally emitted by the workpiece.

51. The system of claim **50** further comprising a cooling subsystem for cooling said first and second filtering devices.

52. The system of claim **50** wherein at least one of said first and second filtering devices comprises a liquid-cooled window.

53. The system of claim **52** wherein said liquid-cooled window comprises a water-cooled quartz window.

54. A method of heat-treating a workpiece, the method comprising:

a) pre-heating the workpiece to an intermediate temperature; and

b) heating a surface of the workpiece to a desired temperature greater than the intermediate temperature, said heating commencing substantially immediately when the workpiece reaches the intermediate temperature.

55. The method of claim **54** wherein heating the surface of the workpiece comprises commencing said heating within less than one second after the workpiece reaches the intermediate temperature.

56. The method of claim **54** wherein heating the surface of the workpiece comprises commencing said heating within less than one-quarter second after the workpiece reaches the intermediate temperature.

57. The method of claim **54** wherein heating the surface of the workpiece comprises commencing said heating within less than **1** x $\mathbf{10^2}$ milliseconds after the workpiece reaches the intermediate temperature.

58. The method of claim **54** wherein heating the surface of the workpiece comprises commencing said heating within less than **1** x $\mathbf{10^1}$ milliseconds after the workpiece reaches the intermediate temperature.

59. The method of claim **54** wherein heating the surface of the workpiece comprises commencing said heating within an interval following the arrival of the workpiece at the intermediate temperature, the interval having a duration less than or equal to a thermal conduction time of the workpiece.

60. The method of claim **54** wherein pre-heating comprises pre-heating the workpiece for a time period greater than a thermal conduction time of the workpiece.

61. The method of claim **54** wherein heating comprises heating the surface for a time period less than a thermal conduction time of the workpiece.

62. The method of claim **54** wherein heating comprises commencing said heating in response to an indication that the temperature of the workpiece is at least the intermediate temperature.

63. The method of claim **54** further comprising producing the indication.

64. The method of claim **54** wherein pre-heating comprises irradiating the workpiece.

65. The method of claim **64** wherein irradiating comprises exposing the workpiece to electromagnetic radiation produced by an arc lamp.

66. The method of claim **64** wherein irradiating comprises exposing the workpiece to electromagnetic radiation produced by at least one filament lamp.

67. The method of claim **54** wherein pre-heating comprises pre-heating the workpiece at a rate of at least **100**°C per second.

68. The method of claim **54** wherein pre-heating comprises pre-heating the workpiece at a rate of at least **400**°C per second.

69. The method of claim **54** wherein heating the surface of the workpiece comprises irradiating the surface.

70. The method of claim **69** wherein irradiating comprises exposing the surface to electromagnetic radiation produced by a flash lamp.

71. The method of claim **69** wherein irradiating comprises moving a laser beam across the surface.

72. The method of claim **54** further comprising absorbing radiation reflected and thermally emitted by the workpiece.

73. The method of claim **72** wherein absorbing comprises absorbing the radiation in a radiation absorbing environment.

74. The method of claim **72** wherein absorbing comprises absorbing the radiation in at least one radiation absorbing surface.

75. The method of claim **74** further comprising cooling the at least one radiation absorbing surface.

76. A system for heat-treating a workpiece, the system comprising:

a) a pre-heating device operable to pre-heat the workpiece to an intermediate temperature; and

b) a heating device operable to heat a surface of the workpiece to a desired temperature greater than the intermediate temperature, and operable to commence the heating of the surface substantially immediately when the workpiece reaches the intermediate temperature.

77. The system of claim **76** wherein said heating device is operable to commence the heating of the surface within less than one second after the workpiece reaches the intermediate temperature.

78. The system of claim **76** wherein said heating device is operable to commence the heating of the surface within less than one-quarter second after the workpiece reaches the intermediate temperature.

79. The system of claim **76** wherein said heating device is operable to commence the heating of the surface within less than $\mathbf{1 \times 10^2}$ milliseconds after the workpiece reaches the intermediate temperature.

80. The system of claim **76** wherein said heating device is operable to commence the heating of the surface within less than $\mathbf{1 \times 10^1}$ milliseconds after the workpiece reaches the intermediate temperature.

81. The system of claim **76** wherein said heating device is operable to commence the heating of the surface within an interval following the arrival of the workpiece at the intermediate temperature, the interval having a duration less than or equal to a thermal conduction time of the workpiece.

82. The system of claim **76** wherein said pre-heating device is operable to pre-heat the workpiece for a time period greater than a thermal conduction time of the workpiece.

83. The system of claim **76** wherein said heating device is operable to heat the surface for a time period less than a thermal conduction time of the workpiece.

84. The system of claim **76** further comprising a temperature indicator operable to produce an indication of a temperature of the workpiece.

85. The system of claim **84** wherein said heating device is operable to commence the heating in response to an indication from said temperature indicator that the temperature of the workpiece is at least the intermediate temperature.

86. The system of claim **76** wherein said pre-heating device comprises means for irradiating the workpiece.

87. The system of claim **76** wherein said pre-heating device comprises an irradiance source operable to irradiate the workpiece.

88. The system of claim **87** wherein said irradiance source comprises an arc lamp.

89. The system of claim **87** wherein said irradiance source comprises at least one filament lamp.

90. The system of claim **76** wherein said pre-heating device comprises a hot body locatable to pre-heat the workpiece.

91. The system of claim **76** wherein said pre-heating device is operable to pre-heat the workpiece at a rate of at least **100**°C per second.

92. The system of claim **76** wherein said pre-heating device is operable to pre-heat the workpiece at a rate of at least **400**°C per second.

93. The system of claim **76** wherein said heating device comprises means for irradiating the surface.

94. The system of claim **76** wherein said heating device comprises an irradiance source operable to irradiate the surface.

95. The system of claim **94** wherein said irradiance source comprises a flash lamp.

96. The system of claim **93** wherein said irradiance source comprises a laser.

97. The system of claim **76** further comprising a radiation absorbing environment operable to absorb radiation reflected and thermally emitted by the workpiece.

98. The system of claim **76** further comprising at least one radiation absorbing surface operable to absorb radiation reflected and thermally emitted by the workpiece.

99. The system of claim **98** further comprising a cooling subsystem operable to cool said at least one radiation absorbing surface.

100. A system for heat-treating a workpiece, the system comprising:

a) means for pre-heating the workpiece to an intermediate temperature; and

b) means for heating a surface of the workpiece to a desired temperature greater than the intermediate temperature, comprising means for commencing the heating substantially immediately when the workpiece reaches the intermediate temperature.

101. The system of claim **100** wherein said means for commencing comprises means for commencing the heating within less than one second after the workpiece reaches the intermediate temperature.

102. The system of claim **100** wherein said means for commencing comprises means for commencing the heating within less than one-quarter second after the workpiece reaches the intermediate temperature.

103. The system of claim **100** wherein said means for commencing comprises means for commencing the heating within less than **1** x $\mathbf{10^1}$ milliseconds after the workpiece reaches the intermediate temperature.

104. The system of claim **100** wherein said means for commencing comprises means for commencing the heating within an interval following the arrival of the workpiece at the intermediate temperature, the interval having a duration less than or equal to a thermal conduction time of the workpiece.

105. A semiconductor heating apparatus, comprising:

a first heating source for heating a first surface of a semiconductor wafer;

a second heating source for heating a second surface of the semiconductor wafer; and

a first cooled window disposed between the first heating source and the semiconductor wafer.

106. The semiconductor heating apparatus of claim **105**, wherein the first cooled window comprises a first optically transparent plate cooled by a cooling fluid.

107. The semiconductor heating apparatus of claim **106**, wherein the first cooled window further comprises a second optically transparent plate separated from the first optically transparent plate to define a passageway through which the cooling fluid may flow.

108. The semiconductor heating apparatus of claim **106**, wherein the cooling fluid is water.

109. The semiconductor heating apparatus of claim **106**, wherein the first optically transparent plate is formed from quartz.

110. The semiconductor heating apparatus of claim **107**, wherein the second optically transparent plate is formed from quartz.

111. The semiconductor heating apparatus of claim **105**, further comprising a second cooled window disposed between the second heating source and the semiconductor wafer.

112. The semiconductor heating apparatus of claim **105**, wherein the first cooled window absorbs radiation thermally emitted by the semiconductor wafer.

113. The semiconductor heating apparatus of claim **112**, wherein the first cooled window absorbs radiation to controllably cool the semiconductor wafer at a rate of at least **100**°C per second.

114. The semiconductor heating apparatus of claim **111**, wherein the second cooled window absorbs radiation to controllably cool the semiconductor wafer at a rate of at least **100**°C per second.

115. The semiconductor heating apparatus of claim **105**, wherein the first heating source includes an arc lamp.

116. The semiconductor heating apparatus of claim **105**, wherein the second heating source includes an arc lamp.

117. The semiconductor heating apparatus of claim **105**, wherein the first heating source is a tungsten lamp or array of tungsten lamps.

118. The semiconductor heating apparatus of claim **105**, further comprising a chamber housing the semiconductor wafer, wherein said chamber has one or more walls with a radiation-absorbing surface.

119. The semiconductor heating apparatus of claim **105**, further comprising a chamber housing the semiconductor wafer, wherein said chamber has one or more walls with a radiation-reflecting surface.

120. The semiconductor heating apparatus of claim **119**, wherein said chamber walls are inwardly tapered at an angle from **2** to **6** degrees from perpendicular.